

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis 1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No
PCT/IB2005/051244

International filing date (day/month/year)
15 04 2005

Priority date (day/month/year)
20 04 2004

International Patent Classification (IPC) or both national classification and IPC
G11B7/24, G11B7/135

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N V

1 This opinion contains indications relating to the following items

- ☒ Box No I Basis of the opinion
- ☐ Box No II Priority
- ☐ Box No III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No IV Lack of unity of invention
- ☒ Box No V Reasoned statement under Rule 43bis 1(a)(i) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- ☐ Box No VI Certain documents cited
- ☐ Box No VII Certain defects in the international application
- ☐ Box No VIII Certain observations on the international application

2 FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66 1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220

3 For further details, see notes to Form PCT/ISA/220

Name and mailing address of the ISA



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/051244

Box No. I Basis of the opinion

- 1 With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b))
- 2 With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of
 - a type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ in written format
 - ☐ in computer readable form
 - c time of filing/furnishing
 - ☐ contained in the international application as filed
 - ☐ filed together with the international application in computer readable form
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/051244

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-7
	No: Claims	8-12
Inventive step (IS)	Yes: Claims	
	No: Claims	1-12
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1 : FERRY ZIJP ET AL.: "Zero-field MAMMOS recording system with a blue laser, NA=0.95 lens, fast magnetic coil, and thin cover layer" PROCEEDINGS OF SPIE, vol. 5069, September 2003 (2003-09), pages 19-26, XP002341410

D2 : US 2004/013077 A1 (SAITO KIMIHIRO ET AL) 22 January 2004 (2004-01-22)

D3: US-A-6 064 641 (BRAAT ET AL) 16 May 2000 (2000-05-16)

D4 : US 6 097 688 A (ICHIMURA ET AL) 1 August 2000 (2000-08-01)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3)PCT.

2.1.1 Document D1, which is considered to represent the most relevant state of the art to the subject matter of claim 1, discloses (the references in parentheses applying to this document):

An optical data storage system for recording and/or reading, using a radiation beam having a wavelength λ , focused onto a data storage layer of an optical data storage medium (see section 1, page 19, lines 16-17), said system comprising:

- the medium, having a cover layer that is transparent to the focused radiation beam, said cover layer having a thickness h smaller than 5 μm (see section 3, page 21, lines 14-15),

- an optical head, including an objective having a numerical aperture NA, said objective including a solid immersion lens that is adapted for being present at a free working distance from an outermost surface of said medium and arranged on the cover layer side of said optical data storage medium, and from which solid immersion lens the focused radiation beam is coupled by evanescent wave coupling into the cover layer of the optical data storage medium during

recording/reading (see section 2, page 19, lines 24-29 and figure 1),
characterized in that,
the thickness variation Δh of the cover layer over the whole medium is smaller
than 50 nm (see section 3, page 22, lines 16-17).

- 2.1.2 The subject-matter of independent claim 1 differs from the disclosure of D1 in that:
The free working distance is smaller than $\lambda/10$.
- 2.1.3 The problem to be solved by the present invention may therefore be regarded as:
how to increase the amount of light that can be detected by the photodetector.
- 2.1.4 In view of D2 the solution proposed in claim 1 of the present application cannot be
considered as involving an inventive step (Article 33(3) PCT) for the following
reasons:

The difference between the prior art (D1) and independent claim 1 consists merely
in reducing the free working distance.

However, the free working distance is just a trade between the intensity of light
detected by the photodetector and the complexity and tolerance to vibrations of the
servo system. It is always desired to have the smallest free working distance
possible within the limits of tolerance of the system in order to increase the amount
of light that can be detected by the photodetector. Therefore, if the optical data
storage system used does not give the free working distance desired (smaller than
 $\lambda/10$), it is only needed to increase the complexity and decrease the tolerance to
vibrations of the optical storage system.

An optical storage system that provides said free working distance is disclosed in
document D2 (see page 2, paragraph 39 and figure 1) and hence, no inventive
step is present in the subject-matter of claim 1.

- 2.1.5 Therefore the features disclosed in D1 and D2 would be combined by the skilled
person, without exercise of any inventive skills in order to solve the problem posed.
The proposed solution in independent claim 1 thus cannot be considered inventive

(Article 33(3) PCT).

3 INDEPENDENT CLAIM 8

- 3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 8 is not new in the sense of Article 33(2) PCT.

Document D3 discloses (the references in parentheses applying to this document):

A method of optical recording and/or reading with a system as claimed in claim 3 (see claim 7), wherein:

- the free working distance is kept constant by using a first, high bandwidth servo loop based on a gap error signal, e.g. derived from the amount of evanescent coupling between the solid immersion lens and the cover layer (see column 4, lines 62-64),
- the first optical element is actuated based on the first servo loop (see column 4, lines 64-67),
- a second, low bandwidth servo loop is active based on a focus control signal derived from the modulation depth of a modulated signal recorded in the data storage layer (see column 4, lines 45-50),
- the second optical element is adjusted based on the second servo loop in order to retrieve an optimal modulated signal (see column 4, line 67 to column 5, line 2).

4 DEPENDENT CLAIMS 2-7, 9-12

Dependent claims 2-7, 9-12 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT) for the reason that the subject-matter of said claims is disclosed in documents D1, D2, D3 or D4 or represents simple details which are known to the person skilled in the art.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/051244

EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 08212579

PUBLICATION DATE : 20-08-96

APPLICATION DATE : 01-02-95

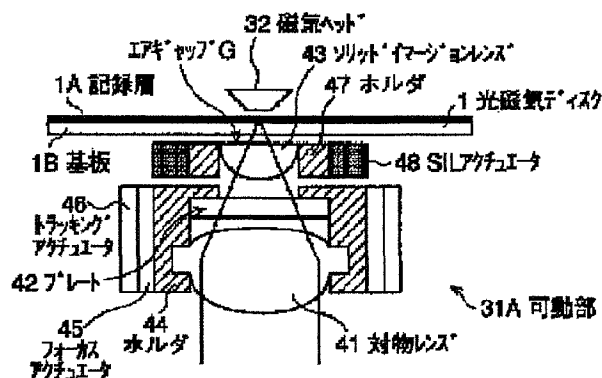
APPLICATION NUMBER : 07015185

APPLICANT : SONY CORP;

INVENTOR : YAMAMOTO KENJI;

INT.CL. : G11B 7/135 G11B 7/09 G11B 11/10

TITLE : OPTICAL HEAD, LIGHT IRRADIATION METHOD, AND RECORDING MEDIUM DRIVING DEVICE



ABSTRACT : PURPOSE: To suppress the occurrence of spherical aberration due to dispersion in thickness of a solid immersion lens and a magneto-optical disk.

CONSTITUTION: The magneto-optical disk 1 is irradiated with light converged by an objective lens 41 through a plate 42 and a solid immersion lens 43. A holder 44 holding the objective lens 41 and the plate 42 is focus-controlled and tracking-controlled respectively by a focus actuator 45 and a tracking actuator 46. Further, an SIL actuator 48 is driven corresponding to the change in capacity of a capacitor formed between the holder 44 and the holder 47, and it is controlled so that an interval between the holders 47 and 44 becomes a fixed value.

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